



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

U.S. Department of Transportation  
**Federal Aviation Administration**  
**Standard**

NAS AIRSPACE SYSTEM  
(NAS)  
SOFTWARE DEVELOPMENT

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## DOCUMENT CHANGE NOTICE

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<p>This notice informs recipients that the standard identified by the number (and revision letter) shown in block 4 has been changed. The pages changed by this DCN (being those furnished herewithin) carry the same date as the DCN. The page numbers and dates listed below in the summary of changed pages, combined with nonlisted pages of the original issue of the revision shown in block 4, constitute the current version of this specification.</p>							
13. DCN No.	14. Pages changed					S*	A/D*
1	This change incorporates the following NCP: 15142.  Change pages are:  9 through 16					S	08/04/93

\*S = Indicates Supersedes Earlier Pages    \*A = Indicates Added Page    \*D = Indicates Deleted Page

Department of Transportation  
Washington, DC 20591

NAS Software Development Standard

1. This standard has been approved by the Federal Aviation Administration (FAA).
2. Beneficial contents (recommendations, additions, deletions) and pertinent data which may be of use in improving this document should be addressed to:

Department of Transportation  
Federal Aviation Administration  
System Engineering and Configuration  
Management Division (ASE-200)  
800 Independence Ave., S.W.  
Washington, D.C. 20591

## FOREWORD

1. This standard sets forth the practices and provides guidance for software development for the National Airspace System.
2. This standard imposes the requirements of the Department of Defense (DOD)-STD-2167A, dated 29 February 1988, with appropriate tailoring of DOD-STD-2167A for specific FAA requirements and practices. Since this standard relies heavily upon the requirements in DOD-STD-2167A, any revisions to DOD-STD-2167A will be reviewed and this standard will be revised as appropriate.
3. This standard is to be used in conjunction with FAA-STD-018, Software Quality Program Requirements.
4. This standard is not intended to specify or discourage the use of any particular software development methods that best support the achievement of contract requirements.
5. This standard, together with the other FAA, DOD, and military documents referenced in Section 2, provides the means for establishing, evaluating, and maintaining quality in software and associated documentation.
6. Data Item Descriptions (DIDs), applicable to this standard are listed in Section 6 of DOD-STD-2167A. These DIDs describe a set of documents for recording the information required by this standard. Production of deliverable data using automated techniques is encouraged.

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## 1. SCOPE

1.1 Scope. This standard establishes uniform requirements for software development that are applicable throughout the system life cycle the requirements of this standard provide the basis for Government insight into a contractor's software development testing and evaluating efforts.

1.2 Purpose. The purpose of this standard is to establish requirements to be applied during the acquisition, development, and support of software systems.

1.3 Application. The requirements of this standard apply to the development of Computer Software Configuration Items (CSCIs). This standard applies to a specific subsystem to the extent specified in the contract clauses, the Statement of Work (SOW), and the Contract Data Requirements List (CDRL).

1.3.1 System development. Application of this standard must be coordinated with MIL-STD-499, Engineering Management, for total system development.

1.3.2 Software quality program. Application of this standard must be coordinated with FAA-STD-018, Software Quality Program Requirements, to provide a complete software quality program.

1.3.3 Firmware. This standard applies to the development or support of the software element of firmware. This standard does not apply to the hardware element of firmware.

1.3.4 Software metrics. This standard must be coordinated with AFSC Pamphlet 800-43, software management indicators, to provide visibility into the acquisition and software development process.

1.3.5 Software configuration management. Application of this standard must be coordinated with FAA-STD-021, Configuration Management (Contractor Requirements), to provide a complete software configuration management program.

1.3.6 Software developed by Government agencies. The provisions of this standard may be applied to Government agencies. When a Government agency performs software development or support in accordance with this standard, the term "contractor" refers to that Government agency and the term "subcontractor" refers to any contractor of that Government agency.

1.3.7 Other applications. While the requirements of this standard apply to CSCIs, these requirements may be selectively applied to the development of software not identified as a CSCI (such as software portions of hardware configuration items and firmware, and non-deliverable software). In such cases, the term CSCI may be interpreted to refer to the selected software.

1.4 Tailoring of this standard. This standard contains a set of requirements that must be appropriately tailored for each contract by the contracting agency to ensure that only cost effective requirements are cited.



## 2. REFERENCED DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following Government documents of the issue in effect on the date of invitation for bid or request for proposal, form a part of this standard to the extent specified herein.

## FAA Standards

FAA-STD-005 Preparation of Specification Documents

FAA-STD-021 Configuration Management (Contractor Requirements)

## Military Standards

DOD-STD-2167 Defense System Software Development

2.1.2 Other government documents, drawings, and publications. None

(Copies of specifications, standards, handbooks, drawings and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting agency or as directed by the contracting officer.)

2.2 Other publications. None.

2.3 Order of precedence. In the event of conflict between the documents listed herein and contents of this standard, the contents of this standard shall be a superseding requirement.

### 3. DEFINITIONS

3.1 Allocated baseline. As allocated requirements are grouped into a specific function or set of functions, a new configuration item (CI) is identified. The development specification which contains the "design to" technical requirements shall be the basis for detail design. Establishment of the allocated baseline occurs with the authentication of the development specification.

3.2 Authentication. Determination by the Government that specification content is acceptable.

3.3 Baseline. A configuration identification document or a set of such documents formally designated and fixed at a specific time during a CI's life cycle. Baselines, plus approved changes from these baselines, constitute the current configuration identification.

3.4 Computer data definition. A statement of the characteristics of the basic element of information operated upon by hardware in responding to computer instructions. These characteristics may include, but are not limited to, type, range, structure, and value.

3.5 Computer hardware. Devices capable of accepting and storing computer data, executing systematic sequence of operations on computer data, or producing control outputs. Such devices can perform substantial interpretation, computation, communication, control, or other logical function.

3.6 Computer resources. The totality of computer hardware, software, personnel, documentation, supplies, and services applied to a given effort.

3.7 Computer software (or software). A combination of associated computer instructions and computer data definitions required to enable the computer hardware to perform computational or control functions.

3.8 Computer Software Component (CSC). A distinct part of a computer software configuration item (CSCI). CSCs may be further decomposed into other CSCs and Computer Software Units (CSU).

3.9 Computer Software Configuration Item (CSCI). A configuration item for computer software.

3.10 Computer software documentation. Technical data or information, including computer listings and printouts, which documents the requirements, design, or details of computer software, explains the capabilities and limitations of the software or provides operating instructions for using or supporting computer software during the software's operational life.

3.11 Computer Software Unit (CSU). An element specified in the design of a Computer Software Component (CSC) that is separately testable.

3.12 Configuration identification. The currently approved or conditionally approved technical documentation for a configuration item as set forth in specifications, drawings, and associated lists, and documents referenced therein.

3.13 Configuration item. An aggregation of hardware/software, or any of its discrete portions, which satisfies an end-use function and is designated by the Government for configuration management. CIs may vary widely in complexity, size, and type; from a system, group, or set to a unit, assembly, subassembly, or part. During development and initial production, CIs are only those specification items that are referenced directly in a contract.

3.14 Contracting agency. As used in this standard, contracting agency refers to the "contracting office" as defined in Federal Acquisition Regulation Subpart 2.1 or its designated representative.

3.15 Developmental configuration. The contractor's software and associated technical documentation that defines the evolving configuration of a CSCI during development. It is under the development contractor's configuration control and describes the software design and implementation. The Developmental Configuration for a CSCI consists of a software Design Document and source code listings. Any item of the Developmental Configuration may be stored on electronic media.

3.16 Evaluation. The process of determining whether an item or activity meets specified criteria.

3.17 Firmware. The combination of a hardware device and computer instructions or computer data that reside as read-only software on the hardware device. The software cannot be readily modified under program control.

3.18 Formal Qualification Testing (FOT). A process that allows the contracting agency to determine whether a configuration item complies with the allocated requirements for that item.

3.19 Functional Baseline. The functional baseline is normally the first baseline established and is usually the product of the system requirements process. It shall be established by authentication of the system specification or item specification. This document becomes the contractor's technical base for accomplishing system requirements analysis and allocating functions to configuration items.

3.20 Hardware Configuration Item (HWCI). See configuration item.

3.21 Independent verification and validation (IV&V). Verification and validation performed by a contractor or Government agency that is not responsible for developing or performing the activity being evaluated. IV&V is an activity that is conducted separately from the software development activities governed by this standard.

- 3.22 Non-developmental software (NDS). Deliverable software that is not developed under the contract but is provided by the contractor, the Government, or a third party. NDS may be referred to as reusable software, Government furnished software, or commercially available software, depending on its source.
- 3.23 Product baseline. The detailed design shall be documented in the form of a product specification and associated drawings. Authentication of the product specification and/or drawings and interface control or other documentation shall establish the product baseline.
- 3.24 Release. A configuration management action whereby a particular version of software is made available for a specific purpose (e.g., released for test).
- 3.25 Reusable software. Software developed in response to the requirements for one application that can be used in whole or in part, to satisfy the requirements of another application.
- 3.26 Software development file (SDF). A repository for a collection of material pertinent to the \_\_\_\_\_